UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,980	03/22/2004	Yin L. Cheung	HESI.112275	2205

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ART UNIT	PAPER NUMBER
2628	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)	
Office Action Summary	10/806,980	CHEUNG ET AL.	
	Examiner	Art Unit	
	Phu K. Nguyen	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>29 June 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-52</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-52</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some *   c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

PHU K. NGUYEN
PRIMARY EXAMINER
GROUP 2300

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>4/11/07</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Holden (VoxelGeo 1.1.1, Productivity Tool for Geosciences).

As per claim 1, Holden teaches the claimed "program storage device readable by a

machine, the device tangibly embodying a program of instructions executable by the

machine to perform method steps of imaging a three-dimensional (3D) volume", the

method steps comprising: "creating one or more three-dimensional (3D) sampling

probe(s), wherein each 3D sampling probe is a sub-volume of the 3D volume" (Holden,

Editing the Volume, page 9-19; working on a sub-volume; page 6-4, the subvolume will

allows the process speed increase due to the reduction in processed data;); "drawing

an image of the 3D sampling probe(s), the image comprising an intersection of the 3D

sampling probe(s) and the 3D volume" (Holden, figure shows the sub-volume in page 9-

21); and "repeating the drawing step responsive to movement of the 3D sampling

probe(s) within the 3D volume so that as the 3D sampling probe(s) moves through the

3D volume" (Holden, Editing along the selected axis; page 9-22). It is noted that Holden

does not teach "the image of the 3D sampling probe(s) is redrawn substantially at the same time as the 3D sample probe is moved." However, since Applicant's reason of a fast redrawing speed is reduction of processed data (i.e., using sub-volume instead of whole volume), it is just a trade off between the processing speed and the amount of processed data (Holden mentions that in page 6-4). Furthermore, the "sample probe" is interpreted as a position locator which defines the coordinates of a sample within the volume which is equivalent to Holden's GeoSeed (page 8-16). Applicant's arguments on the slider bar is not correct because the slider bars are used to adjust the size of the sub-volume, which is associated with the sample probe, but not the sample probe itself. Since Holden's disclosure of movement of Geo Seed (page 8-16) is always associated with input from a user, drawing is always associated with providing perception to a user, and concurrency is always described as sufficiently fast to be perceived as real-time by the user, the redrawing steps are equivalent. Thus, it would have been obvious to provide the sample probe at substantially the same time as the probe is moved for the purpose of enhancing the interaction of the user to viewing the 3D voxel data.

RESPONSE TO APPLICANT'S ARGUMENTS:

Applicant's arguments filed June 29, 2007 have been fully considered but they are not deemed to be persuasive. Applicant argues about a sample probe which is equivalent to Holden's Geo Seed (page 8-16). Applicant argues about the "real time" speed which is obvious due to its reduction of processed data; and Holden emphasizes this concept in page 6-4 ("more complex volumes require more time to render" or less complex volume, requires less time to render).

Claim 2 adds into claim 1 "repeating the drawing step to reshape the 3D sampling probe(s) so that as the 3D sampling probe(s) is changed in shape, the image of the 3D sampling probe(s) is redrawn substantially at the same time" (Holden, Editing the volume; page 9-19).

Claim 3 adds into claim 1 "the image of the 3D sampling probe(s) is redrawn at a frame rate of at least about 10 to 15 frames per second" which Holden does not teach. However, Holden's video interface for a "smooth" displaying indicates the generation of a plurality of frames about 10-15 per second as claimed.

Claim 4 adds into claim 1 "extracting from the 3D volume a sub-volume data set corresponding to the surfaces of the 3D sampling probe(s); and texture mapping the sub-volume data set onto the surfaces of the 3D sampling probe(s)" which is obvious for displaying of 3D volume on the screen (official notice).

Applicant is requested to provide the complete User's Guide of the VoxelGeo 1.1 software which is deemed to disclose the features of manipulation (e.g., rotation), object's attributes (e.g., transparency), texturing, ...

Claims 5-8 add into claims 1 and 2 "repeating the drawing step to rotate, independently or dependently, a 3D orientation of the 3D volume and the 3D sampling probe(s) so that as the 3D orientation is changed, the image of the 3D sampling probe(s) is redrawn substantially at the same time" which is obvious for translating two interrelated volumes in the screen (official notice).

Claim 9 adds into claim 1 "drawing an image of an intersection of one of the 3D sampling probes with another one of the 3D sampling probes" (Holden, modifying the probe into any shapes which can be an intersection of two larger probes; pages 9-19 to 9-21).

Claim 10 adds into claim 9 the one of the 3D sampling probe(s) is a data probe and the another one of the 3D sampling probe(s) is a substantially transparent cut probe that cuts out a 3D sub-section of the data probe so that the image of the intersection of the data probe and the cut probe comprises an intersecting surface internal to the data probe" (Holden, modifying the probe into any shapes which can be an intersection of two larger probes; pages 9-19 to 9-21; the transparency property is well known – official notice - in displaying the volumes on screen).

Claim 11 adds into claim 10 "drawing an image of a third 3D sampling probe, wherein the third 3D sampling probe is volume rendered at least partially within the 3D

sub-section of the data probe" (Holden, modifying the probe into any shape which can

be partially within another probe; pages 9-19 to 9-21).

Claim 12 adds into claim 1 "dividing the image of the 3D sampling probe(s) into a

plurality of over-lapping sub-images; and simultaneously drawing the plurality of over-

lapping sub-images, thereby increasing a field-of-view to the user" which is obvious for

displaying several volume on a screen (official notice).

Claim 13 adds into claim 1 "the 3D volume is defined by a data set of voxels,

each voxel expressed in the form of x, y, z, data value" (Holden, figure in page 9-21).

Claim 14 adds into 13 "data selected from the group comprising seismic data,

remote sensing data, well log data, gravity and magnetic field data, sidescan sonar

image data, temperature, pressure, saturation, reflectivity, acoustical impedance and

velocity" (Holden, seismic data; page 9-21).

Claim 15 adds into claim 13 "extracting from the 3D volume a sub-volume data

set corresponding to the 3D sampling probe(s); and volume rendering the sub-volume

data set in accordance with a transparency setting that is a function of each data value,

thereby volume imaging the 3D sampling probe(s)" (Holden, modifying the probe into

any shapes which can be an intersection of two larger probes; pages 9-19 to 9-21; the

transparency property is well known – official notice - in displaying the volumes on

screen).

Claim 16 adds into claim 13 "identifying a seed point, wherein the seed point is a

voxel within the data set of voxels that defines one of the 3D sampling probe(s); and

defining a selection criteria based on the data values, the drawing step being carried out

to image selected points only within the 3D sampling probe, wherein the selected points

are connected to the seed point, and the data values of the selected points satisfy the

selection criteria" (Holden, GeoSeed; page 9-19).

Claim 17 adds into claim 16 "the 3D sampling probe containing the seed point is

an auto picking 3D sampling probe" (Holden, GeoSeed; page 9-19); wherein the

repeating step is carried out so that as the auto picking 3D sampling probe moves

through the 3D volume, the image of the selected points is redrawn within at least one

of the auto picking 3D sampling probe and the 3D volume substantially at the same

time" (Holden, subset the volume data; pages 9.19 to 9.22).

Claim 18 adds into claim 17 "the repeating step is carried out so that as the auto

picking 3D sampling probe moves through the 3D volume, the image of the selected

points is redrawn only within the auto picking 3D sampling probe substantially at the

same time" (Holden, subset the volume data; pages 9.19 to 9.22).

Claim 19 adds into claim 17 "defining an eraser 3D sampling probe; and defining

a de-selection criteria based on data values, wherein the repeating step is carried out so

that as the eraser 3D sampling probe moves through the selected points that satisfy the

de-selection criteria, the selected points that satisfy the de-selection criteria are deleted

from the image substantially at the same time" which is obvious for editing the 3D

volume objects on computer graphics (official notice).

Claim 20 adds into claim 1 "the image of the 3D sampling probe(s) is redrawn

substantially at the same time as the 3D sampling probe(s) moves through the 3D

volume so that a user-selected feature defined by the data values is at least partially

visualized." The reasonable interpretation is that the image is redrawn substantially at

substantially the same time as the sampling probe is moved. Since Holden's disclosure

of movement, in page 9-22, is always associated with input from a user, drawing is

always associated with providing perception to a user, and concurrency is always

described as sufficiently fast to be perceived as real-time by the user, the redrawing

steps are equivalent. Thus, it would have been obvious to provide the sample probe at

substantially the same time as the probe is moved for the purpose of enhancing the

interaction of the user to viewing the 3D voxel data.

Due to the similarity of claims 21-26 to claims 1-20, they are rejected under the

same reason.

Claims 27-52 are identical to claims 1-26 except in claims 1, 21, 24, the language of "the image of the 3D sampling probe(s) is redrawn substantially at the same time" and in claims 27, 47, and 50, "the image of the 3D sampling probe(s) is redrawn in real time" which so close in content that they both cover the same thing; therefore, they are rejected under the same reason.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu K. Nguyen whose telephone number is (571) 272 7645. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (571) 272 7664. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Phu K. Nguyen
September 29, 2007

PHU K. NGUYEN
PRIMARY EXAMINER
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